

Mid-Atlantic Coastal Ocean Observing Regional Association (MACOORA)
SEMI-ANNUAL REPORT

April 8, 2005

Combining the CSC mid-year Grant and Ocean.US Report Requests

1.0 Progress on Regional Association Development

1.1 We are pleased to report that we have accomplished another major milestone in ensuring broad participation of data producers and users in the formalization of MACOORA by hosting a series of five subregional meetings. MACOORA's subregions are organized around the major estuarine systems within the MACOORA footprint and include: the South New England Bight (Massachusetts and Rhode Island Bays and Shelf – MARIBS), Long Island Sound, New York Bight, Delaware Bay, and Chesapeake Bay. These meetings were held as follows:

Chesapeake Bay	December 6-7, 2004	59 attendees
Long Island Sound:	January 13, 2005	42 attendees
Delaware Bay	January 14, 2005	18 attendees
New York Bight:	February 28, 2005	55 attendees
South New England Bight (Massachusetts and Rhode Island Bays and Shelf – MARIBS):	March 15, 2005	43 attendees

The meetings built on the first organizational meeting of MACOORA (formerly MARA) in August, 2004. Each of the meetings shared a common structure, including the following key elements:

Update on IOOS

- Overview of observing systems, existing & future technologies and applications
- IOOS certification process; funding prospects
- NOAA CO-OPS

Update on MACOORA

- Report of August Workshop
- Next steps, aims of this workshop

Working Group Sessions

- User Engagement
- Data/Product Needs
- Governance

The outcomes from these meetings are being used to structure a region-wide meeting to be held on May 17-18, 2005 with the purpose of developing MACOORA's draft charter and governance structure. To date we have sent out 659 invitations for this meeting. We will make use of the experience and documentation from other Regional Associations, and continue development of our MACOORA rolling business plan, moving toward eligibility for regional association certification.

Given the strong marine transportation industry presence in the region, we have focused, but by no means limited, our user outreach to the ocean shipping community. This is a natural evolution of IOOS, given the existence of PORTS (Physical Oceanographic Real Time Systems)

in Narragansett Bay, New Haven, New York Harbor, Delaware Bay, and Chesapeake Bay. PORTS is a well-known and respected entity in the maritime community for safe and efficient navigation, and will serve as a stepping stone for further outreach and applications. MACOORA has also had great success in engaging the commercial and recreational fisheries industry, the United States Coast Guard with their Search and Rescue (SAR), oil spill response, and national security capabilities, state and local water quality and resource management officials, and many others.

Stakeholders that have participated in the MACOORA meetings include:

Federal Agencies (11)

Alliance of Coastal Technologies
EPA
NASA
NOAA
NPS
NWS
Ocean.US
US Army Atmospheric Effects Team
US Army Corps of Engineers
US Coast Guard

State/Local Agencies (17)

DE Sea Grant
DE Geological Survey
DE River Basin Commission
DNREC
Hudson River NERR
MD Dept of Natural Resources
MD Emergency Management
Agency
MD Sea Grant
NJ Dept of Environment
NJ Dept of Transportation
NJ Sea Grant
NJMSC
NY Sea Grant
NYS Dept of Conservation
NYS Dept of State
SC Sea Grant
VA Sea Grant

Academic Institutions (20)

Brookdale Community College
Chesapeake Research Consortium
Columbia University
Johns Hopkins University
Lamont Doherty Earth Observatory
Monmouth University
Old Dominion University

Penn State University
Rutgers University
Smithsonian Environmental
Research Center
Stevens Institute of Technology
Stony Brook University
University of Connecticut
University of Delaware
University of Maryland
University of Massachusetts
University of Rhode Island
University of Southern Maine
US Naval Academy
VIMS

Private Organizations (19)

Battelle Memorial Institute
Boeing
College Valley Enterprises
DE Bay & River Cooperative
Environmental Resource
Management Inc.
Hampton Roads Maritime
Association
Harbor Ops – Maritime Association
of the Port of NY & NJ
JGD Associates
Maritime Association of the Port of
NY & NJ
Maritime Exchange for the DE Bay
Maritrans
NY Aquarium
Orbitron Corporation
Pilots Association for the Bay &
River DE
Port Authority of NY & NJ
RD Instruments
StormCenter Communications
Weatherflow

Wheat International
Communications
NGOs (5)
Chesapeake Bay Foundation

Chesapeake Bay Waterkeepers
Jersey Shore Partnership
NY/NJ COAST
The River Project

We have established and staffed the MACOORA administrative office by retaining Dave Chapman as part-time Executive Director of MACOORA. Dave is a naval architect by training and worked for many years with the Delaware River and Bay Authority. He currently is employed at the University of Delaware as Marine Transportation Specialist with the University's Sea Grant College Program Marine Advisory Service, and is an active member of the American Association of Port Authorities (AAPA) and the North Atlantic Ports Association (NAPA).

We have also strengthened our capabilities for education by engaging the Mid-Atlantic Center for Ocean Science Education Excellence (MA COSEE). MA COSEE offers a unique opportunity for educators to participate in the development of innovative resources that incorporate the excitement of current oceanographic research and technology into the classroom. "Taking the Pulse of the Changing Planet" is a workshop for middle school science teachers, giving them an opportunity to integrate research science with education programs to improve access to and understanding of modern ocean science and how it affects our daily lives. MACOORA's Executive Director, David Chapman, is part of the MA COSEE team, and helped to conduct the July 2004 "Taking the Pulse of the Changing Planet" workshop, as did MACOORA Co-PI's Bill Boicourt and Scott Glenn. The New York Bight subregional meeting in February was attended by MA COSEE members from New York Aquarium, Stevens Institute, Rutgers University, and the University of Delaware.

We are also pleased to report that in January we introduced our MACOORA website to provide information and communication capabilities, with the following elements: About MACOORA, News & upcoming events, Meetings, workshops & reports, National ocean observing - OCEAN.US, National Federation of Regional Associations (NFRA), Contact Us, Subregional observing systems, Analysis & forecasting centers, Education, outreach, & research centers, including links to the Ocean.US and NFRA websites.

We are working to develop inventory of MACOORA ocean observing systems, coordinate and integrate federal backbone and subregional ocean observing systems activities within the MACOORA footprint, and facilitate communication and management of data streams from multiple sources.

We have organized a team to develop pilot project candidates, including the integration of existing HF radar projects in the region and adding radar and data management equipment to augment and expand the existing network.

MACOORA continues to support the development of IOOS nationally, through NFRA.

- MACOORA submitted its three-year proposal for continued funding to support MACOORA's evolution as an integral player of the national IOOS effort.

- 1.2 Results of the subregional workshops are contained in the workshop reports, which are available through links on the MACOORA website, www.macoora.org.
- 1.3 In the next year, we will make progress on preparing the business plan, engaging stakeholders, addressing DMAC and establishing education and outreach activities. The process of engaging stakeholders and preparing the business plan will be the key goal of the May 17-18, 2005 workshop. A Fall 2005 workshop will further address this goal, moving MACOORA towards NFRA certification in 2006.

DMAC is a critical element of our subregional coordination and integration efforts, and will be an integral part of our ongoing activity.

Education and outreach will center on our MA COSEE involvement, including participation in a weeklong summer workshop for middle school science teachers in Cambridge, Maryland.

2. *Priorities for Observations from Regional Perspective*

Coastal Observing Systems in the MACOORA Region include the following:

Overview websites:

<http://www.csc.noaa.gov/coos/northeast.html>

<http://www.csc.noaa.gov/coos/southeast.html>

Federal

National Data Buoy Center (NDBC) Moored Buoys and C-Man Stations

National Water Level Observation Network (NWLON)

Physical Oceanographic Real-Time System (PORTS)

Narragansett Bay

New Haven

New York/New Jersey Harbor

Delaware Bay

Chesapeake Bay

National Estuarine Research Reserve (NERR) System Wide Monitoring Program (SWMP)

Waquoit Bay

Hudson River

Mullica River

Delaware

Chesapeake Bay – Maryland

Chesapeake Bay – Virginia

National Marine Fisheries Service (NMFS)

Sandy Hook Lab

US Army Corps of Engineers (COE) – Field Research Facility (FRF) and Wave Sites

US Geological Survey Stream (USGS) Gauge Network

US Environmental Protection Agency (EPA) – Water Quality Monitoring

NASA Goddard – Coastal Monitoring Network

State and Local

New York City - Water Quality

New Jersey Department of Environmental Protection (NJDEP) – Water Quality

Maryland Department of Natural Resources – Eyes on the Bay

Academic

Chesapeake Bay Mouth Monthly Surveys

Chesapeake Bay Observing System (CBOS)

Delaware Bay Observing System (DBOS)

Johns Hopkins Applied Physics Lab (JHU/APL) - Satellite Data Acquisition Center

Long-term Ecosystem Observatory (LEO)

Martha's Vineyard Coastal Observatory (MVCO)

Monitoring Your Sound (MYSound)

New Jersey Coastal Monitoring Network (NJCMN)

New Jersey Shelf Observing System (NJSOS)

New York City College – Satellite Data Acquisition Center

New York Harbor Observing System (NYHOS)

Regional Fisheries Applications Center

Virginia Institute of Marine Science Real-time Data

Private

Alliance for Chesapeake Bay Citizen Monitoring Program

Oceanweather, Inc.

Weatherflow, Inc.

2.1 Identification of top five priorities for developing the National Backbone (observations, DMAC and modeling) for FY06-07 and then 08-12, as in last year's Ocean.us status and priorities report.

We have not gone through the process on a region-wide basis since the last report. Our five sub-regional meetings have generated considerable input in this area. While we suspect the priorities will not change much, we will engage a representative group at our May 17-18, 2005 workshop to address the issue. We are sensitive to parts of the MACOORA community that have not had much to say about the priorities feel that the researchers have not included them.

Priorities for Developing the National Backbone

1. National Long-range Multi-static HF Radar network to provide surface current maps through most of the EEZ. This is the only technology capable of providing this high need dataset.
2. Enhancements to the NOAA Data Buoy network which provide mostly surface data. Upgrades include more buoys for better resolution of wind and wave fields (which often vary on the larger synoptic scale of the atmosphere), the ability to place downward looking acoustic sensors (like ADCPs) on the surface moorings, and the ability to put long-range HF Radar transmitters on the larger buoys to enhance resolution and extend coverage.
3. Greater access to a larger number of satellites, including international. Negotiations with foreign governments for licensing fees. Access to more satellites reduces revisit intervals so we can begin to look at the shorter time scales of the coastal ocean. High spectral and

spatial resolution further facilitates the production of coastal products. Develop a national archive for the satellite data. Many of these products may be single use by individuals, but there are many users around the country.

4. UNOLS/NOAA fleet renewal, including ships and aircraft. Observatories increase the need for coastal vessels, as does interdisciplinary research and fast response to events. More coastal vessels will be required as well as coastal aircraft. Continue to implement the plan for four national aircraft centers (east, gulf, west coasts and Alaska).
5. Data management at a national level that includes existing national centers at NOAA and NASA that makes it easier to share data.

2.2 Identification of top five Regional Ocean Observations priorities observations, DMAC, modeling, stakeholder engagement, and include pilots and research for FY06-07 and then for FY08-12.

As for Item 2.1 above, we have not gone through the process on a region-wide basis since the last report. Our five sub-regional meetings have generated considerable input in this area. While we suspect the priorities will not change much, we will engage a representative group at our May 17-18, 2005 workshop to address the issue. We are sensitive to parts of the MACOORA community that have not had much to say about the priorities feel that the researchers have not included them.

Regional Ocean Observations Priorities

1. Nested High-Resolution Multi-Static HF Radar Arrays to map surface currents in high interest areas like the entrances to and inside major bays and ports. Leveraging between the national network and the regional enhancements will facilitate implementation.
2. Establish sentinel stations in bays and offshore.– These will be long-term observation sites using moorings and cabled observatories that emphasize long-duration continuous interdisciplinary observations, including physical and bio-optics, with high vertical resolution. These differ from the NOAA sites in that the vertical water column observations are central. They will include wave and wind sensors to further enhance the NOAA network.
3. Locally-acquired real-time satellite imagery for high use regional products. Many coastal visible products can be enhanced if local calibrations are used. The bio-optical sensors at the sentinel stations will provide the means for vicarious calibration of the local satellite products with processing priorities set locally rather than nationally.
4. Endurance lines – These will be regularly occupied sampling lines that provide subsurface spatial data required for data-based subsurface nowcasts, and by ocean modelers for assimilation into forecast models. Instrumented ferries are a good platform option for nearshore, long-duration glider AUVs are a good platform option for offshore. Approximately 5 cross-shelf endurance lines are anticipated, with ferries instrumented in all bays.
5. Regional data management. Designed to make it easier to aggregate data, produce real-time web products, to serve as a regional archive, and to interact with the national scale management structure.

3.0 Issues, Challenges and Opportunities

This should include lessons learned, issues that may need to be resolved among regions or at the national level, regional and local funding opportunities, processes not working, etc.

The challenge of going through the IOOS process in the mid-Atlantic is significant but doing it on a combined sub-regional and regional level seems to be working. However, this requires equally active participants in both the regional sense (MACOORA), the sub-regional (our five subregions), and even smaller sub-units such as New York Harbor or Hampton Roads. We successfully had five sub-regional meetings suggesting our approach will work in our region. How the national concept of the NFRA deals with these sub-regions that individually have significant economic benefits to be gained from IOOS might be discussed and resolved.

Funding in our region is like others; a mix of research and congressional mandates. Groups within the region are increasingly attempting the congressional mandate approach to funding. This will no doubt raise issues of 'haves and have nots' just as it does at the national level.

Including the maritime industry (shipping) is a real challenge but we do have their ear. Keeping them involved takes individuals 'on the ground' meeting with them in their offices and at their meetings, not just inviting them to our conferences. They tend to view the IOOS as a research effort but understand that IOOS is real and they must keep their interests included while not wasting too much time on this.

4.0 Recommendations for Conferences and Workshops (issues that should be addressed, desired outcomes or deliverables, etc.). Please try to tie these recommendations to the issues, challenges, opportunities identified in 3.0

- *Annual Implementation Conference*
- *NFRA meetings*
- *Workshops, including regional industry, DMAC, or identification of others needed*

An issue related to shipping is how to effectively include the shipping industry in the IOOS process. It is critical that they have their input during the process of priority making. All aspects of the shipping industry have association offices in the DC area. Examples include the American Association of Port Authorities (AAPA), American Pilot's Association (APA), Dredging Contractors of America, International Council of Cruise Lines, Chamber of Shipping of America, American Maritime Congress, National Ocean Industries Association, American Petroleum Institute, and the American Shipping Association.

Those offices must be worked with by the national office (Ocean.US) or its representatives. The regional shipping industries will rely on the national offices for decisions. Conference specifically dealing with this may help but they cannot be 'research' driven. We need to engage them on their own turf as well, by participating in their meetings, working side by side at the committee level, and using every opportunity to solicit their input and ideas, and to promote IOOS.

Specific data management recommendations beyond the 'concrete recommendations' produced by the first DMAC must be provided very soon.

The NFRA meetings should become a 'trade association' meeting where the RAs and leaders in the sub regions if appropriate can meet to address topics of interest to them.

5.0 Recommendations of Additional Resource Needs (not necessarily money for the RAs, but such as: a) support of the NFRA; b) guidance on data issues (e.g., telemetry) that are relevant prior to the point where the DMAC picks up; c) guidance on modeling; d) more focused studies on the economic benefits of ocean observing; e) a funded national IOOS education effort, for example...). Again, we should try to tie these recommendations to the issues, challenges, opportunities identified in 3.0

Funding for the RAs at the level suggested originally is still valid. Many of the challenges related to data, modeling, economic benefits and education require funding.

The IOOS process calls for economic benefit studies early on in the process yet at present only a few studies have been funded. Compared to the activity in education this is a small effort yet critical to success of IOOS: by showing its relevance economically. Since education is supported by NSF and other agencies why not focus more effort on economic studies to justify IOOS?

The Airlie House report and others gave prioritized lists of variables needed to produce needed products. Why not fund efforts to produce those products on a demonstration basis? A national surface current system nearly exists now in a research stage. Why not have a goal of creating a national system? Better access to NOAA supplied remote sensing products has also been a commonly expressed need. A focused effort to improve them would be effective.